

may be regularly coiled as in most aeolids (*Phyllodesmium xeniae*), or long and much entangled: sand covered (Strombidae) or free of any deposits (most Anaspidae).

An attempt has been made to classify the egg masses of the gastropods studied as well as those of other gastropods (including the pulmonates) into common types instead of dealing separately with the spawns of either the prosobranchs, opisthobranchs or pulmonates. This method helps to avoid false typifying of spawn morphologies among the Gastropoda and reduces the major types to only four. A better understanding of the reproductive biology of gastropods could be achieved by studying other aspects of reproduction of the three subclasses together in the way followed with their egg masses.

SYSTEMATIC REVISION OF THAIDID GENERA BASED ON ANATOMY. Silvard P. Kool, The George Washington University, Washington, D.C..

The status and validity of the thaidid genera *Thais* (Roeding 1798), *Purpura* (Bruguière 1789), *Nucella* (Roeding 1798), and *Mancinella* (Link 1807) were examined by study of the type species of each genus (*T. nodosa*, *P. persica*, *N. lapillus*, *M. alouina*, respectively). Five other species presently allocated to these four genera were studied as well.

Due to a high degree of convergence in shell morphology and considerable intra- and interspecific variability in shell shape, only anatomical and radula characters were considered. Twenty-five characters were taken from the reproductive system, alimentary system, and mantle cavity, and nine from radular morphology. Phylogenetic relationships are proposed based on a cladistic analysis using the Wagner 78 program. A phenogram was obtained using the PHYSIS UPGMA analysis.

This study indicates a clear distinction between *Nucella* and *Thais*, both considered valid genera herein. The genus *Mancinella* likewise deserves full generic status. The genus *Purpura*, *sensu lato*, is not monophyletic; thus the older generic name *Purpurella* (Dall 1871) should be resurrected for the Caribbean species, *P. patula*.

FANCY FOOTWORK: FUNCTIONAL MORPHOLOGY OF THE FOOT OF THE LIGHTING WHELK *BUSYCON CONTRARIUM*. J. Voltzow. Duke University, Durham, North Carolina.

Gastropods crawl, leap, burrow, mate, and catch prey using a single, flexible foot. The foot of *Busycon* is composed of a complex network of blood vessels, muscle fibers, and connective tissue. Near the pedal ventral surface, blood is channeled through discrete spaces delimited by the muscle and connective tissue of the sole. This musculature consists of a three-dimensional interwoven network of collagen-wrapped muscle fibers. Recordings of intramuscular pressure from the feet of *Busycon* reveal specific patterns of pressure fluctuations that correspond to the behaviors of resting, crawling and burrowing. Each pattern is the result of muscles antagonizing muscles directly and indirectly via the blood-muscle-connective tissue continuum of the sole. The special

features of this continuum are responsible for the flexibility of the gastropod foot.

HATCHING SIZE VARIATION IN *NUCELLA LAPILLUS* ALONG AN ENVIRONMENTAL GRADIENT OF WAVE EXPOSURE. Ron J. Etter, Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts

Embryonic development of many marine prosobranchs occurs within benthic egg capsules and the nourishment to sustain development is provided in the form of nurse eggs. Hatching size in these snails is dependent on the number of nurse eggs an embryo ingests during this period and is typically quite variable. Several hypotheses have been advanced to support the notion that interpopulation variation in hatching size is adaptive, although little direct evidence is available. One such hypothesis proposes that hatching size will be larger where environmental stresses are more severe. The intertidal snail *Nucella lapillus* was used to examine this hypothesis along an environmental gradient of wave exposure. Although the length and volume of egg capsules were similar among populations, the number of hatchlings emerging from capsules were positively, and their mean size negatively correlated with wave action. Intrapopulation variation in hatching size, in part, reflects differences in the number of embryos placed within egg capsules while variation between populations appears to result from differences in the number of nurse eggs deposited within capsules. Since shores protected from heavy wave action tend to experience more stressful conditions, both biotically and abiotically, these findings indicate hatching size varies in the predicted direction.

DIET AND THE CRYSTALLINE STYLE IN THE OMNIVOROUS NEOGASTROPOD, *ILYANASSA OBSOLETA* (SAY). Lisa C. Hendrickson, North Dartmouth, Massachusetts.

Temporal fluctuations in crystalline style wet weight and protein content were measured for the deposit-feeding omnivore, *Ilyanassa obsoleta*, to determine whether variations in style size are attributable to differential digestive responses, of mudsnails, to particular diets.

Mudsnails (12.0-14.0 mm) held in laboratory microcosms were allowed to feed, for one hour, on either a carrion or microalgal food source, following a five-day starvation period. A control group consisted of snails that remained starved throughout the experiment. Simultaneous measurements of style wet weight and protein content were collected for all three groups, and their corresponding normalized means were plotted over a 12-hour period.

Fluctuations in the mean style size of algae-fed snails reflected those of the control group, however, the mean style size of snails fed carrion did not change significantly during the experimental period. Further studies, which focus on the extracellular digestion of carrion, are being conducted.

SEASONAL VARIATION IN THE FREEZING TOLERANCE OF THE MARSH SNAIL *MELAMPUS BIDENTATUS*. D. R. Hayes and S. H. Loomis, Department of Zoology, Connecticut College, New London.